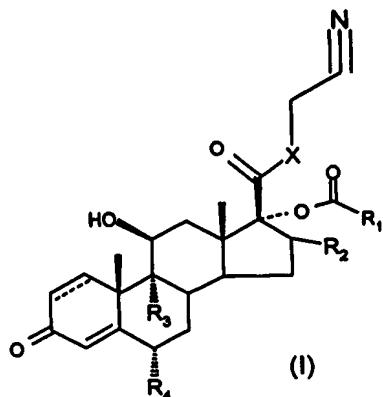


CLAIMS

1. A compound of formula (I):



5 wherein

X represents O or S;

R₁ represents C₁₋₈ alkyl, C₃₋₈ cycloalkyl, C₃₋₈ cycloalkylmethyl or C₃₋₈ cycloalkenyl any of which optionally may be substituted by one or more methyl groups or halogen atoms or R₁ represents aryl, substituted aryl, heteroaryl or substituted

10 heteroaryl;

R₂ represents hydrogen, methyl, which may be in either the α or β configuration, or methylene;

R₃ and R₄ are the same or different and each independently represents hydrogen, halogen or a methyl group;

15 and ---- represents a single or a double bond;

or a physiologically acceptable salt or solvate thereof.

2. A compound as claimed in claim 1 wherein X represents O.

20 3. A compound as claimed in claim 1 or claim 2 wherein R₁ represents a C₃₋₈ cycloalkyl group optionally substituted by one or more methyl or chlorine groups.

4. A compound as claimed in any one of claims 1 to 3 wherein R₁ represents 2,2,3,3-tetramethylcyclopropyl.

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5. A compound as claimed in any one of the preceding claims wherein R₂ represents methyl in the α-configuration.

6. A compound as claimed in any one of the preceding claims wherein R₃ and R₄ are both fluorine.

7. A compound as claimed in anyone of the preceding claims wherein
5 ----- represents a double bond.

8. A compound as claimed in any one of the preceding claims which is
6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester;
10 17 α -(4-[Diethylamino)sulphonyl]benzoyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester;
15 17 α -(5-Chloro-4-methoxy-thiophene-3-carbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl -3-oxo-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester;
20 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
25 17 α -(Cyclohexylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
30 6 α ,9 α -Difluoro-17 α -(2,6-difluorobenzoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
35 6 α ,9 α -Difluoro-11 β -hydroxy-17 α -(4-methoxybenzoyl)oxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
30 17 α -(4-Cyanobenzoyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
35 17 α -(Cyclopentylmethylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
30 6 α ,9 α -Difluoro-17 α -(3,3-dimethylbutanoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
35 6 α ,9 α -Difluoro-11 β -hydroxy-17 α -(2-isopropyl-1,3-thiazole-4-carbonyl)oxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
30 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(quinoline-2-carbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;
35 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(5-trifluoromethyl-furan-2-carbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl -17 α -(5-methylsulphonyl-thiophene-2-carbonyl)oxy-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester; 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl -17 α -(5-methylthio-thiophene-2-carbonyl)oxy-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

5 6 α ,9 α -Difluoro-17 α -(5-ethyl-isoxazole-3-carbonyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester; 9 α -Fluoro-11 β -hydroxy-16 β -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester.

10 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androst-4-ene-17 β -carboxylic acid cyanomethyl ester; 17 α -(5-Chloro-4-methoxy-thiophene-3-carbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl -3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

15 17 α -(2,2-Dichloro-3,3-dimethylcyclopropylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester; 17 α -(2,2-Dichloro-3,3-dimethylcyclopropylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester; 17 α -(Cyclohexylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-

20 androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester; 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl -17 α -(5-methylsulphonyl-thiophene-2-carbonyl)oxy-3-oxo-androsta-1,4-diene-17 β -carbothioic acid S- cyanomethyl ester; 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(5-trifluoromethyl-furan-2-carbonyl)oxy-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester; or

25 6 α ,9 α -Difluoro-17 α -(3-(difluoromethylthio)benzoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester.

9. A compound as claimed in claim 8 which is

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carbothioic acid S- cyanomethyl ester;

30 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

9 α -Fluoro-11 β -hydroxy-16 β -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

17 α -(Cyclohexylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

5 17 α -(Cyclopentylmethylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

6 α ,9 α -Difluoro-17 α -(3,3-dimethylbutanoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

10 6 α ,9 α -Difluoro-17 α -(3-(difluoromethylthio)benzoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester;

17 α -(Cyclohexylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester;

15 6 α ,9 α -Difluoro-17 α -(5-ethyl-isoxazole-3-carbonyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-17 α -(5-methylthio-thiophene-2-carbonyl)oxy-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

6 α ,9 α -Difluoro-11 β -hydroxy-17 α -(2-isopropyl-1,3-thiazole-4-carbonyl)oxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

20 17 α -(2,2-Dichloro-3,3-dimethylcyclopropylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester; or

17 α -(2,2-Dichloro-3,3-dimethylcyclopropylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester.

25 10. A compound as claimed in claim 9 which is

17 α -(2,2-Dichloro-3,3-dimethylcyclopropylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester;

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carbothioic acid S-cyanomethyl ester; or

30 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester

35 11. A compound as claimed in claim 10 which is

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(2,2,3,3-tetramethylcyclopropylcarbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid cyanomethyl ester.

5 12. A compound of formula (I) as defined in any one of claims 1 to 11 or a physiologically acceptable solvate thereof for use in veterinary or human medicine.

10 13. Use of a compound of formula (I) as defined in any one of claims 1 to 11 or a physiologically acceptable solvate thereof for the manufacture of a medicament for the treatment of inflammatory and/or allergic conditions.

15 14. A pharmaceutical composition comprising a compound of formula (I) as defined in any one of claims 1 to 11 or a physiologically acceptable solvate thereof together, if desirable, in admixture with one or more physiologically acceptable diluents or carriers.

20 15. A pharmaceutical aerosol formulation comprising a compound of formula (I) as defined in any one of claims 1 to 11 or a physiologically acceptable solvate thereof, and a fluorocarbon or hydrogen-containing chlorofluoro carbon as propellant, optionally in combination with a surfactant and/or a cosolvent.

25 16. A pharmaceutical composition according to claim 15 which further comprises another therapeutically active agent.

30 17. A pharmaceutical composition according to claim 16 in which said another therapeutically active agent is a β_2 -adrenoreceptor agonist.

35 18. A method for the treatment of a human or animal subject with an anti-inflammatory and/or allergic condition, which method comprises administering to said human or animal subject an effective amount of a compound of formula (I) as defined in any one of claims 1 to 11 or a physiologically acceptable solvate thereof.

19. A compound which is 17 α -(4-[(Diethylamino)sulphonyl]benzoyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid

6 α ,9 α -Difluoro-17 α -(2,6-difluorobenzoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

6 α ,9 α -Difluoro-11 β -hydroxy-17 α -(4-methoxybenzoyl)oxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

5 17 α -(4-Cyanobenzoyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

6 α ,9 α -Difluoro-17 α -(3,3-dimethylbutanoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

6 α ,9 α -Difluoro-11 β -hydroxy-17 α -(2-isopropyl-1,3-thiazole-4-carbonyl)oxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

10 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(quinoline-2-carbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(5-trifluoromethyl-furan-2-carbonyl)oxy-androsta-1,4-diene-17 β -carboxylic acid

15 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl -17 α -(5-methylsulphonyl-thiophene-2-carbonyl)oxy-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl -17 α -(5-methylthio-thiophene-2-carbonyl)oxy-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

6 α ,9 α -Difluoro-17 α -(5-ethyl-isoxazole-3-carbonyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

20 20 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl -17 α -(5-Chloro-4-methoxy-thiophene-3-carbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl -3-oxo-androsta-1,4-diene-17 β -carboxylic acid

17 α -(2,2-Dichloro-3,3-dimethylclopropylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carboxylic acid

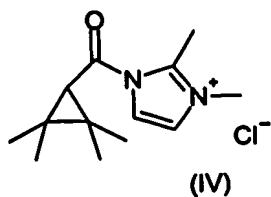
25 17 α -(2,2-Dichloro-3,3-dimethylclopropylcarbonyl)oxy-6 α ,9 α -difluoro-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid

6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl -17 α -(5-methylsulphonyl-thiophene-2-carbonyl)oxy-3-oxo-androsta-1,4-diene-17 β -carbothioic acid

30 30 6 α ,9 α -Difluoro-11 β -hydroxy-16 α -methyl-3-oxo-17 α -(5-trifluoromethyl-furan-2-carbonyl)oxy-androsta-1,4-diene-17 β -carbothioic acid, or

6 α ,9 α -Difluoro-17 α -(3-(difluoromethylthio)benzoyl)oxy-11 β -hydroxy-16 α -methyl-3-oxo-androsta-1,4-diene-17 β -carbothioic acid.

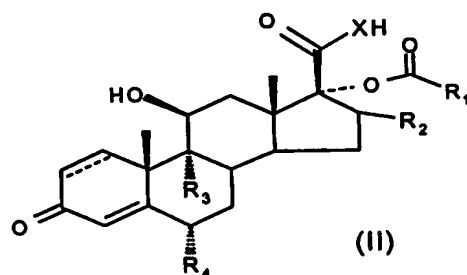
20. A compound of formula (IV):



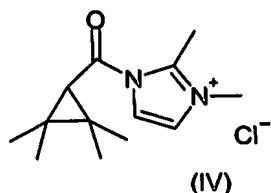
5

2,3-dimethyl-1-[(2,2,3,3-tetramethylcyclopropyl)carbonyl]-1*H*-imidazol-3-ium chloride.

21. A process for preparing a compound of formula (II)

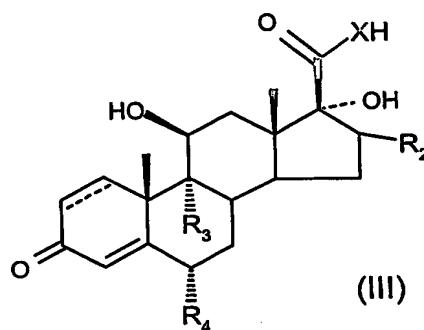


10 where R₁ represents 2,2,3,3 – tetramethyl cyclopropyl and R₂, R₃, R₄, X and ---
are as defined in any one of claims 1 to 7 which process comprises reaction of the
1,2-dimethyl-1*H*-imidazolium ester of 2,2,3,3-tetramethylcyclopropane carboxylic
acid (IV)



15

with the corresponding 17a-hydroxy derivative of formula (III)



22. A process as claimed in claim 21 in which X represents O.